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WINDOWS 2000 INTEGRATION



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IA-64 Solutions

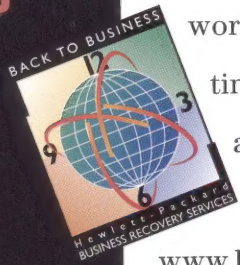
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Vol. 15, No. 4



Cover Photograph by Andy Roberts/Stone

WINDOWS 2000

10 All in the Family: A Revealing Look at HP's Windows 2000 Services and Products

HP, as a Microsoft Windows 2000 Global Launch Partner, revealed its aggressive services strategy and a number of new products at the recent Microsoft Expo. HP is abundantly prepared to support Windows 2000 with the complete family of hardware products and a comprehensive service program.

By Robert Williams

18 Winning with Win2K

The much-anticipated and simultaneously much-dreaded Windows 2000 is here, and IT professionals now have to deal with it. Here is a primer on Windows 2000, its new features, and some reasons to adopt, or wait and see. By Ryan Maley

APPLICATION PORTING

24 Building Reusable Components from UNIX Applications

The promise of object-oriented programming is to promote the reuse of code. Unfortunately, in most of these programming languages, software reuse occurs at the source or binary level. Component programming is an extension to the concept of object-oriented programming that allows programmers to make use of reusable objects dynamically, using only binary representations. By Andrew Lowe

DATABASE MANAGEMENT

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To remain competitive, Houlihan's Restaurant Group realizes that they need to manage their data extremely well. Houlihan's IT staff is charged with the critical task of ensuring the safety of the company's data. From daily food, liquor and labor costs, to year-on-year analysis of sales, the company relies on their data to be successful. By Karla Winter

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HP and Intel expect much from the move to IA-64. Whether or not they'll be successful remains to be seen. By Jean Nattkemper

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It is very easy to get stuck in a rut, doing the same things the same ways, repeatedly. The purpose of this month's column is to help vi users get out of that rut. By Fred Mallett

35 On the Server Side: HP OpenMail and Red Hat Linux, Part 2 - HP OpenMail

Last column, Ryan talked about HP's port of its OpenMail messaging system to Linux. Now, he covers the installation of OpenMail. By Ryan Maley

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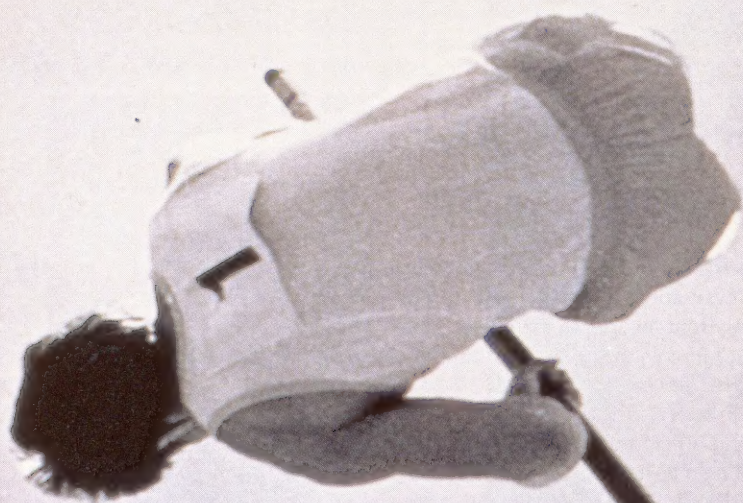
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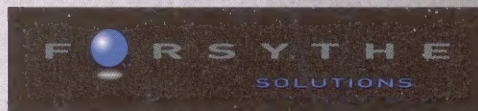




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In the Hoopla over Win 2000, HP Maintains a Steady Course

The reactions to Microsoft's formal launch of Windows 2000 in February were not entirely unpredictable. Windows fans gave rosy evaluations of the beefed-up operating system, and detractors issued warnings about everything from security to reliability.

In the midst of the hoopla, it was hard to forecast just how far Win 2000 will take Microsoft. Analysts and users seemed to agree that Win 2000 bests NT in terms of scalability and reliability. And most were enthusiastic about Active Directory – the new feature that allows IS managers to manage computers, printers and other devices on their networks.

Whether Win 2000 is a worthy challenger to UNIX, though, remains to be seen. NT boxes are already challenging UNIX systems at the low end, and that is sure to continue, and maybe accelerate, with Win 2000. In fact, last month HP unveiled new Win 2000-certified 4-way/6-way NetServers – the LH 6000 and LT 6000r systems – that offer a considerable price/performance advantage over entry-level UNIX systems.

On the high end, though, it's a different story. Sun's and HP's flavors of UNIX – Solaris and HP-UX – continue to dominate on networking, database and application servers. And, Linux is coming on strong. Sun is also nipping at Microsoft's heels by attacking NT where it is strongest, by giving away Solaris in the one- to eight-server market.

Then, there are Internet devices – cell phones, pagers and other appliances. Palm OS is whipping Windows CE in this market. And, Linux is catching on for embedded devices. In fact, HP scored a triumph in the embedded device market last month by announcing that Lynx Real-Time Systems has agreed to use Chai, HP's clone of Java, in BlueCat, the Lynx version of Linux.

Of course, that doesn't mean Microsoft has lost HP as an ally. HP is one of the few hardware vendors to have embraced CE for small devices, although it uses the operating system only in select products. HP also supports the Windows NT Embedded operating system, which Microsoft announced last September. NT Embedded 4.0 – and Windows Terminal Services Edition, included in Win 2000 – represents Microsoft's attempt to fight back in the embedded space.

As Microsoft battles to increase market share with its new Windows release, HP remains opportunistic, partnering with any number of vendors, but shying away from exclusive commitments. HP has traditionally positioned itself as a Switzerland in vendor skirmishes. It has remained neutral, while Microsoft battled with Sun, Oracle, and others in the Java wars, and steadfastly continues to support different operating systems – HP-UX, MPE/iX, Linux and Windows.

HP's strategy for Win 2000 is, of course, critical to *HP Professional*, which views Win 2000 and all other technologies primarily in terms of their effect on HP users. And that raises another issue – the reason why I'm writing this editorial.

As a writer and an editor who has covered HP for several years, I'm a longtime fan of *HP Professional*. Now, I'm delighted to have the opportunity to contribute to it by working for 101communications, the publisher of the magazine.

As *HP Professional's* Editor at Large, I have the opportunity to renew old acquaintances in the HP arena and make new friends. I hope you – the readers – will get in touch with me and give me your comments, suggestions and even criticisms of articles and features. Your feedback will help me to contribute in a way that meets your needs.



Jean Nattkemper

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Uptime Recipe #1

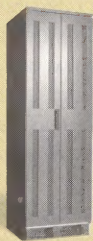
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QLOGIC SUPPORTS OPEN SAN INITIATIVE

QLogic Corp. has joined HP in support of its Open Storage Area Network (SAN) Initiative. The complexity of SAN configurations has brought together both companies to ensure interoperability and manageability in multi-platform, heterogeneous SAN environments. As part of the program, HP will test its SAN solutions for interoperability with QLogic's Fibre Channel host bus adapters.

The SAN Interoperability Program is a component of HP's Open SAN Initiative that supports multi-vendor interoperability in heterogeneous SAN environments for seamless integration and optimizations in total cost of ownership. QLogic has made it a primary objective to participate vigorously in all of the industry's SAN interoperability programs, including the SANMark program administered by the Fibre Channel Industry Association (FCIA).

For more information about QLogic, visit their Web site at www.qlc.com.

IDC Analyst Views HP's Strategy

"Value Propositions for eBusiness 2.0," the theme of this year's IT briefing given by IDC, embraced a number of topics central to HP's e-services strategy. It also gave *HP Professional* a chance to sit down with Frank Gens, IDC's Senior Vice President of Internet Research, on March 6 in San Jose, Calif., and ask him for his views on HP's attempt to become a major player in the new Internet economy.

Gens believes HP is on the right track with its e-services strategy, but says the company still has a lot of work to do. The concept of e-services, he points out, is not as easy for the average businessperson to understand as e-business is. "I think e-business is pretty simple," he explains. "It's doing what you're doing, and doing it on the Internet. E-services are really talking about new business models. You have to work a little harder to sell and educate the market on that, but I think potentially the payoff is much greater, because you're helping to create a new way of doing business."

Gens has a reason for focusing on the businessperson rather than the technology professional. IDC recently asked a panel of Internet executives to identify the people running the Internet initiative in their companies. Of the titles identified, 94 percent were business titles. HP has "a great reputation" in technology user circles, Gens says, but its challenge is to reach the business executives – the CEOs, VPs of marketing and general managers in line of business – who are leading the Internet initiatives.

One way for HP to do that is to "walk the walk themselves." Building a reputation as an e-business worked extremely well for IBM, Dell and Cisco, Gens points out. "Carly Fiorina [HP's CEO] needs to be able to walk, either literally or figuratively, into the domain of the CEO and up to customers and prospects, and say, 'We're experts in this new era of Internet use because we're doing it ourselves.'"

The analyst sees much that HP is doing right. He gives the company high marks for partnering with Internet-centric technology players and integrators, and for actually making investments in some of these companies. "They've put skin in the game," he says.

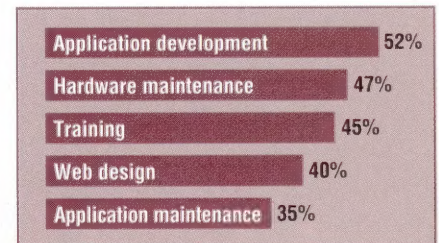
Gens is also impressed by HP's willingness to embrace a risk-sharing business model. "HP is reaching out to dotcom start-ups – not just technology dotcoms, but start-ups in retailing, manufacturing, travel services, financial services, and anywhere you can imagine" Admitting that HP will find some "duds" along the way, Gens says it will also find some "stars." "That will be exciting, because HP will be helping to incubate new players in the Internet economy."

Gens has some words of caution. HP has laid out a vision that will probably take five years to fulfill, he says, and there are no guarantees of success. Nevertheless, the analyst praises the company for "being energetic, innovative, and [for] making the right alliances and associations."

– Jean Nattkemper

MANY COMPANIES OUTSOURCING IT

According to preliminary results from an outsourcing study conducted by Cutter Consortium, 73 percent of companies surveyed outsource some part of their IT services. When asked which aspects of IT are outsourced, the top five areas were:



When asked to compare the amount of IT activities outsourced one year ago to the current amount, 50 percent said their companies are currently outsourcing more than they did a year ago. The top two reasons for increases in outsourcing were satisfaction with a previous outsourcing experience (21 percent), and scarcity of qualified personnel (20 percent).

Michael Mah, a Senior Consultant on Cutter Consortium's Sourcing Advisory Service says, "Companies want to reduce costs on legacy maintenance and re-deploy assets to new applications development to enter new markets. Many companies are looking to access skills by buying them instead of 'growing them organically.' In many cases, companies also see an outsource provider as being able to help them speed process improvement. Whether this is the case ultimately depends on if an organization executes an effective metrics strategy to manage the contract and the service levels via a balanced scorecard."

Mah continues, "Speed to market also seems to be a critical factor. The need to have an e-commerce offering, take advantage of deregulation or capitalize on the reduced trade barriers all require speed to market as a key ingredient. Companies cannot grow or transform their IT capabilities to support changing business needs. Therefore, the strategy of outsourcing is very effective in achieving the speed to market many organizations need. If you cannot operate at Internet speed you get left behind!"

For more information, visit the Cutter Web site at www.cutter.com/consortium.

SUN, WRQ SOLUTIONS FOR PC-UNIX INTEGRATION

Sun Microsystems has named WRQ to provide solutions and support to customers of Sun's Solstice Network Client and Solstice NFS Client products through WRQ's Reflection. Solstice Network Client customers wishing to continue integrating their Sun Solaris applications with their current and future PC desktops can purchase the WRQ Reflection Suite for X and get WRQ's PC X server, in addition to Solaris file access from a PC desktop. WRQ also offers its Guide Services to meet the ongoing technical support and maintenance needs of Sun's customers.

Both companies have also established a bundle agreement, which will increase the reach of the WRQ Reflection Suite for X and Reflection NFS Connection software, which provide integration between Windows-based PCs and UNIX host systems. In accordance with this agreement, HP will ship Reflection products both pre-installed and bundled with the new Windows NT-based VISUALIZE P600C, P650C and P700C Personal Workstations.

A local version of WRQ Reflection X software, which provides precise rendering and integration of UNIX graphical applications from a PC desktop, will be pre-installed on all new HP VISUALIZE P600C, P650C and P700C Personal Workstations. WRQ Reflection NFS Connection, a utility that provides critical printing and file transfer services between Windows-based PCs and UNIX host systems, will also be installed on the Workstations. In addition, the workstations will be bundled with a 60-day trial copy of WRQ Reflection Suite for X, which includes a full version of Reflection X able to run remote X clients plus VT, TN3270 and TN5250 emulations.

For more information, visit their Web site at www.wrq.com/sunsolstice.

HP'S INTEGRATED APPROACH TO WINDOWS 2000 TRAINING

Many businesses are expecting Windows 2000 training challenges. HP offers an evolutionary process that started in a classroom when a team of HP consultants and Microsoft engineers, at labs in the United Kingdom, developed the first Windows 2000 (then NT 5.0) classes. In January 1998, using HP Education's worldwide network of Certified Technical Education Centers (CTECs), these courses became the first to be offered in classrooms on a worldwide scale.

The HP/Microsoft relationship continues to progress as in-classroom courses like the soon-to-be released Integrating UNIX and Windows 2000 Key Technologies are developed and online courses are being introduced continuously.

HP's education framework blends consulting and systems integration with a range of training delivery options, from group classes to interactive Web-based lecture-labs to seminars, mentoring and beyond.

For example, HP project-managed the rollout of 180 Exchange Servers and 45,000 desktops to Nokia's global population. The firm's end user and Information Management Professional population was comprised of multiple job roles, including administrators, account operators, server operators and helpdesk staff.

To find out more about the individual components of the Integrated Learning Approach, visit the HP Web site at www.hp.com/education.

Got Some News?

Please send all news press releases to HP Professional's Editor at Large Jean Nattkemper at jnattkemper@hppro.com.

HP DONATES \$2M FOR IA-64 TEACHING

HP is providing financial grants to four universities, totaling more than \$2 million in cash and equipment. The money will be used to fund teaching of Explicitly Parallel Instruction-set Computing (EPIC).

EPIC is the foundation for IA-64 (Intel Architecture-64 bit), a next-generation computer architecture developed jointly by HP and Intel.

The grants will support the teaching of EPIC principles and have been awarded to:

- **Professor Thomas M. Conte**

Department of Electrical and Computer Engineering, North Carolina State University, for classroom and distance-learning course modules, classroom technology and textbook writing.

- **Professor Wen-Mei W. Hwu**

Department of Electrical and Computer Engineering, and Coordinated Science Laboratory, University of Illinois at Urbana-Champaign, for classroom and distance-learning course modules, classroom technology and textbook writing.

- **Professor Krishna V. Palem**

Center for Research in Embedded Systems and Technology, Georgia Institute of Technology, for classroom technology and modules, laboratory modules and manuals, and teacher-training materials.

- **Professor Nancy J. Warter-Perez**

School of Engineering and Technology, California State University, Los Angeles, for laboratory and classroom modules for dissemination via the Internet.

The HP EPIC Architectures Initiative in Computer Science, sponsored by HP's University Grants Program, will fund curricula for training a new generation of computer engineers and software designers in EPIC-related concepts and will encourage the development of advanced technologies. ♦

"Married with Children" Writer Joins HP Spin-Off

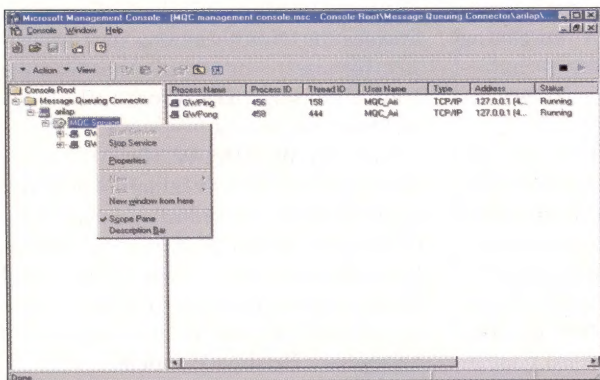
With more than 15 years of experience writing and producing for television shows, including "Married with Children," "ALF," "Nine to Five" and a dozen prime-time pilots for ABC, CBS, FOX, NBC, USA and Showtime, Jeanne Romano now joins recent HP spin-off company, DeepCanyon, as executive producer.

Romano will spearhead Internet strategic planning for DeepCanyon, a multidimensional Web resource for marketers, which provides guidance from industry analysts, tips from marketing experts, information on emerging trends, and more.

Romano began her work on the Internet as a senior producer for Microsoft's MSN where she managed the development of interactive content and built bridges between conventional media technology and the Internet. Since then, she has worked as a promotions consultant to Amazon.com, where she was instrumental in fostering relationships between the online retail giant and the entertainment industry.

For more information, visit www.deepcanyon.com.

Just Like MOM



FALCONMQ

- A MOM product that works in conjunction with Microsoft Message Queuing Services (MSMQ) to extend the capabilities of MSMQ to non-Windows NT operating systems.
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Global professional advisory firm, KPMG LLP, needed a middleware solution that would connect HP's MPE/iX 5.5 operating system with the Windows NT platform.

After an initial search for a suitable middleware product came up empty, KPMG did what any big-name firm with lots of resources would do: It partnered with a trusted software developer.

"We looked at a number of different products and found that nobody had a strong product or strong solution for our purposes," explains Michael Milton, a senior consultant at KPMG LLP. "We then contacted the folks at Level 8. While they didn't have anything off the shelf, they were certainly willing to convert one of their existing products [FalconMQ] for the MPE/iX 5.5 operating system."

A MOM solution, such as FalconMQ, is designed to provide dependable, asynchro-

nous communication between disparate platforms. For example, FalconMQ, a message-oriented middleware (MOM) solution, works in conjunction with Microsoft Message Queuing Services (MSMQ) essentially extending the capabilities of MSMQ to non-Windows NT operating systems, such as IBM AIX, Sun Solaris, HP-UX, Linux, IBM MVS and OS/400, SCO UNIX and VMS. And now, MPE/iX.

It allows a business or organization to integrate with Windows NT any legacy applications that reside on UNIX servers, MVS mainframes, AS/400 and VMS servers, HP3000 servers and Unisys systems.

When the MOM has been implemented properly, an application on one platform can send a message to an application on another platform without being required to wait for an immediate reply. If the receiving application is temporarily unavailable, the message is placed in a queue until it can be delivered.

KPMG initially recognized a need for a MOM solution while in the process of implementing an online storefront for Sunrider International, a multilevel marketing company that manufactures and distributes cosmetics, health foods and household products.

As the senior consultant for the project, Milton studied the various middleware alternatives available, including IBM's

MQSeries and a plain ODBC connection, searching for a solution that would allow the asynchronous and near-real-time transmission of data between the Windows NT and MPE/iX platforms. FalconMQ is the solution he settled on.

Milton couldn't be more pleased with the results: "The FalconMQ software allows us to synchronize data from the NT storefront using Microsoft Site Server as the front-end and the cataloging of the store; send the orders and membership data back and forth instantaneously; and receive shipping confirmations. We were able to leverage the existing ERP system that was on the HP3000. And by the use of messaging and message-queuing technology, send this data back and forth between the two platforms."

Milton reports that KPMG has had no serious problems with FalconMQ, other than working out the usual kinks in documentation. He warns, however, that middleware implementation is not a task to be taken lightly. "This is not a technology that should be implemented by just your standard folks. It takes a great deal of planning and knowledge of what you're trying to do, of what you're trying to accomplish, in order to be able to set up the architecture properly."

— Jeff Dodd,
Contributing Author

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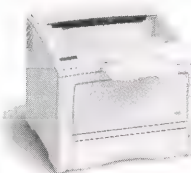
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All in the Family

Robert Williams

A Revealing Look at HP's Windows 2000 Services and Products

The three-day Microsoft Windows 2000 Conference and Expo held in San Francisco was attended by several thousand eager IT professionals. Unlike Microsoft's past major, customer-based product launches, this event was very subdued, presumably to reflect the serious nature of business computing. HP, as a Microsoft Windows 2000 Global Launch Partner, revealed its own aggressive services strategy and a number of new products.

In an approach that is typical of HP, the company is abundantly prepared to support Windows 2000 with the complete family of hardware products and a comprehensive service program. One of the most telling examples of HP's commitment to Windows 2000 was the recent formation of the Microsoft Services Organization. (See sidebar conversation with HP General Manager David Stubbs on page 14.) The new business unit is dedicated to helping customers plan, design, implement and maintain Microsoft technologies across the enterprise to deliver what they hope to be bulletproof computing environments.

The outward relationship between HP and Microsoft exhibited during the event was all grins and thumbs-up. Although there existed some behind-the-scenes concern regarding future product

conflicts, Microsoft's Vice President of Windows Marketing, Deborah Willingham, officially echoed the mutual love by stating, "We are thrilled that HP is presenting such a comprehensive range of hardware, software, services and support for Windows 2000. The depth of HP's services, which include consulting, migration services, license management and training, will give our mutual customers the crucial services they need."

Jim Allchin, Microsoft Group Vice President for Windows Platforms, underscored these views. "HP is building PC systems that are fully optimized for Windows 2000 ... by combining world-class products and services from Microsoft and HP, customers enjoy a smoother migration path and a more consistent, manageable user experience."

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MANAGEABILITY PRODUCTS

For many years, HP has led the pack in cross platform network management tools. With the release of Windows 2000, HP has made a renewed commitment to its flagship OpenView suite. OpenView Microsoft Alliance Manager, John Renshaw, and Product Manager, Pam Peterson, eagerly promoted the new Windows 2000 manageability tools.

The big news is something called Vantage Point for Windows, a collection of technologies that was developed for enterprise Windows 2000 manageability. According to Renshaw, "Vantage Point provides real intelligence instance tracking, and the ability to proactively understand what is being run. Vantage Point and OpenView Express were built from the ground-up to support Windows 2000. This allows significant scalability," (see Figure 1)

Building from its current enterprise successes, HP OpenView Express is designed for mid-size enterprises running Windows 2000 and other operating systems. It combines HP OpenView ManageX for proactive server control and management, OpenView Network Node Manager for network administration and event notification, and OpenView OmniBack II for backup and retrieval of stored digital data. This suite facilitates quicker problem isolation and resolution by integrating network information. Through the use of event correlation, alarms, reporting and threshold establishment, the enterprise system administrator is afforded tools to manage and troubleshoot.

HP OpenView provides policy-based management to monitor Windows 2000 systems, based on predefined thresholds. Action can be taken when failure or degradation is found in CPU utilization, memory usage, disk utilization or performance reliability. OpenView can also be used to automatically restart Windows 2000 services when thresholds are exceeded.

When asked about its relationship to Windows 2000 Active Directory, Renshaw stated that a considerable amount of effort has gone into providing APIs for future development. At this time, the relationship is rather basic, but plans for further integration are in the works. As to the relationship of HP's management tools with Microsoft's System Management Server product, HP was less definitive. "We consider them complementary at this stage, but there may be some functionality overlap in the future ... we will have to see things develop."

In a side discussion with the CIO of Creative Artists Agency (CAA), Michael Keithley, we discovered a big fan of OpenView Express. He gave an example of the requirements that CAA has for storing and retrieving the large amounts of streaming digital data associated with

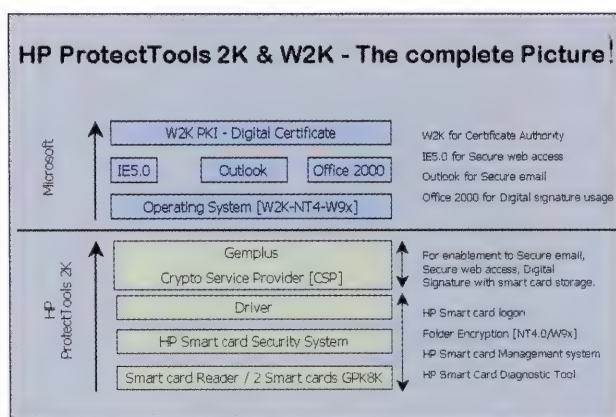


Figure 2: HP ProtectTools 2000 Story

the film, television and recording industry. The need to rapidly produce digital content about their clients is an important factor of their success. Keithley states that the "OmniBack feature, in particular, more than exceeded our expectations. Running OpenView Express on Windows 2000 provides both performance and reduced costs." The company currently uses 45 HP 4- and 8-way NetServer LPr, and LX 8000 and 8500 systems. In addition, it has 25 HP NetServers in place to support file, print, fax and e-mail services.

Another important application suite introduced for support on Windows 2000 is HP TopTools. This set of utilities monitors system activities and alerts users of pending component failure or other potential problems.

ENHANCED SECURITY BUNDLE

One of the key value-added components to the Windows 2000 mix offered by HP is its advanced security products. Denis Bournival, HP Program Manager, shared his thoughts on these security initiatives.

The HP ProtectTools 2000 optimizes the security features already available in Windows 2000. "The Public Key Infrastructure (PKI) features of the OS are further enhanced, for example, by the new HP Smart Card readers," states Bournival. "This technology is finding acceptance across industries, with highest demand in financial, government, and business to business Internet settings." (see Figure 2)

HP views the ProtectTool 2000 as a transaction-enabling technology through the use of Virtual Private Networks. "IPSec performance is also significantly improved," concludes Bournival (see Figure 3 on page 16).

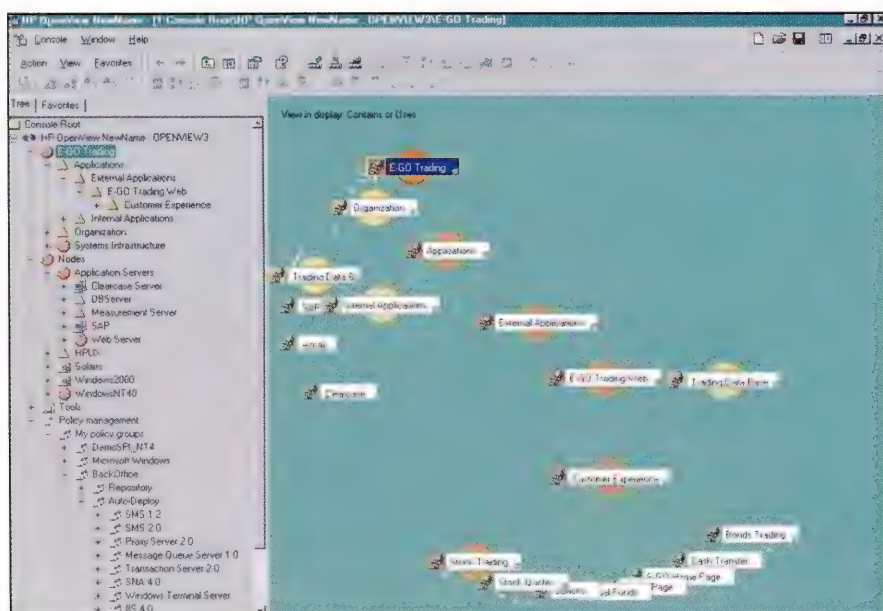


Figure 1: View of Vantage Point Data Tree



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HP takes the concept of their security bundle one step further. One of the most underrated areas of enterprise security relates to power management. If the system fails, costly data could be lost. In response to this issue, HP announced the HP Power Protection Device for Windows 2000. Designed to work directly with the Windows 2000 Professional hibernation mode, this compact device fits into a PC single free expansion shelf. The Power Protection Device is fully automatic, whether the PC is unattended, in sleep mode, in "suspend" mode, or in "Suspend to RAM" mode. All open file and user desktop environment backup is performed in case of power failure, shutting down the PC, cleanly and securely, within five seconds.

SERVICES

HP is extremely aggressive in offering its Windows 2000 services. In a conversation with Ian Bromehead, who manages the Global Microsoft Solutions Services Center in Grenoble, France, he indicated that HP has opened operations around the world to support Windows 2000 proof-of-concept testing, planning and migration. "We want customers to experience Windows 2000 in a real-world environment and then to prototype their enterprise with expert support."

The Windows 2000 Readiness Assessment programs are designed to help clients understand their current IT environment and to contrast these needs against the combined products and services offered by HP and Microsoft. HP consultants work with customers to deliver large and complex implementations in a controlled test environment. The Server and Storage Consolidation Planning program is designed to assist customers to develop and manage an architectural strategy that optimizes Windows 2000 technology.

COMPUTER SYSTEMS FOR 2000

HP announced 13 desktop and laptop models together with an extensive service line in support of Windows 2000. "They have developed a full range of best-in-class business PCs and network servers that will allow customers to enjoy the many benefits of Windows 2000," says Web McKinney, HP's Vice President of PC Organization.

The Windows 2000 business desktop personal computer line includes three primary models. The HP Brio BA400 is the \$799 entry-level system. It is shipped stan-

A Conversation with David Stubbs

General Manager, HP Microsoft Services Operations



David Stubbs began his HP career in 1983 in the Office Products division in the United Kingdom, and later in Hong Kong. Upon transferring to the United States, he was appointed to the position of Marketing Manager of the Software Service Division. In his current position, Stubbs applies his experience in both products and services. In recognition of the strategic importance of Windows 2000, HP created the Microsoft Services Operations division. The newly appointed General Manager of this group graciously spent some time to discuss HP's Windows 2000 programs.

HP Professional: Tell us about the new Microsoft Services Operations Group.

Stubbs: HP's new Windows 2000-based services will help simplify our customer's migration to Windows 2000. We'll be there to help them build a highly reliable IT infrastructure for online businesses, e-services and other strategic business processes in this new environment. We anticipate that about 40 percent of medium to large enterprises will deploy Windows 2000 this year. Our expertise in building and maintaining Microsoft environments will be a key success factor for those customers.

HP Professional: That appears to be an aggressive deployment level by your customers.

Stubbs: Yes, fully 40 percent of the customers we surveyed said they planned to deploy Windows 2000 by year's end. Our team's mission is to help customers unleash the power of Microsoft technology, regardless of their hardware environments.

HP Professional: HP has been a UNIX enterprise leader. How does HP really see Windows 2000 in the enterprise?

Stubbs: Windows 2000 is a very important environment for HP and we find it is particularly vital for our enterprise customers. We recognize the need for interoperability with our UNIX customers also, but the demand for enterprise-level Windows 2000 is significant, and we intend to provide services and products.

HP Professional: What will be the great need for your customers?

Stubbs: Because of the great number of new features, we want to provide assistance in helping customers understand the inherent power and how best to use it. Our services will emphasize process management and basic infrastructure design and support.

HP Professional: Is there a single major challenge in deploying Windows 2000?

Stubbs: Until the technology is fully understood, directory services design is the greatest challenge. We want our customers to understand and plan for the use of Active Directory.

HP Professional: Do you have any final thoughts on HP's position, with regard to Windows 2000?

Stubbs: We are here to help our customers through the entire service cycle: design, planning and maintenance technical services. That is why we have established service centers worldwide. Our sole objective is the success of our customers.

— R.W.

dard with a 500MHz Celeron processor, 64MB SDRAM, 48X CD-ROM and a 10 GB hard-disk drive. The HP Vectra VL600 is priced at \$1,729 and includes a Pentium III 600MHz processor, 128MB RDRAM, 10 GB hard drive, 48X CD-ROM, Matrox

G250 graphics, and 3Com 10/100 PCI card. (A Pentium III 667MHz model is also available for \$1,969.) The HP Kayak XM600 is designed for a more serious small-business environment. At a base price of \$2,319, the system is equipped

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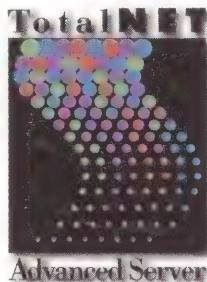


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with a dual Pentium III 600MHz, 128 SDRAM, 15GB hard-disk drive, and Matrox G250 graphics card. All of these systems include Windows 2000 Professional. HP is reporting performance gains of 20 percent for comparably configured systems running Windows 2000 over Windows 98.

The HP laptop Windows-2000 ready systems include both the HP OmniBook 900 "ultra-portables" and the business-designed HP OmniBook 4150 line. The standard configured HP OmniBook900 series are priced from \$2,499 to \$3,499, with Intel Pentium III process ranging in clock speeds from 450MHz to 650Mhz. All models except one come with a 13.3-inch XGA screen. The OmniBook 4150 ranges in price from \$2,199 to \$4,299, with a wide range of Intel processors. They all support 14.1-inch XGA screen and hard-disk drives, ranging in size from 6GB to 18GB.

The most important announcements surrounded the HP NetServer Systems. HP is offering a new set of models, and providing upgrade services for existing NetServers. HP is targeting Windows 2000 Advanced Server for the HP NetServer line because of the promised improved scalabil-

ity, performance, reliability and uptime for database, file and Web servers. The Transaction Processing Performance Council employed its TPC-H benchmark against Sun Microsystems computers. The HP NetServer LXr8500 with an eight-way configuration was ranked first, running Windows 2000 Advanced Server over the 12-way Sun Enterprise 4500. It should also be noted that the HP NetServer costs 30 percent less than the tested Sun system.

FINAL VIEWS

When attending product launches, it is common to feel jaded by over-hyped promises of products and services. I certainly felt this way when visiting some of the vendors at this Windows 2000 Conference and Expo. In contrast, HP appears to have its Windows 2000 act together. ♦

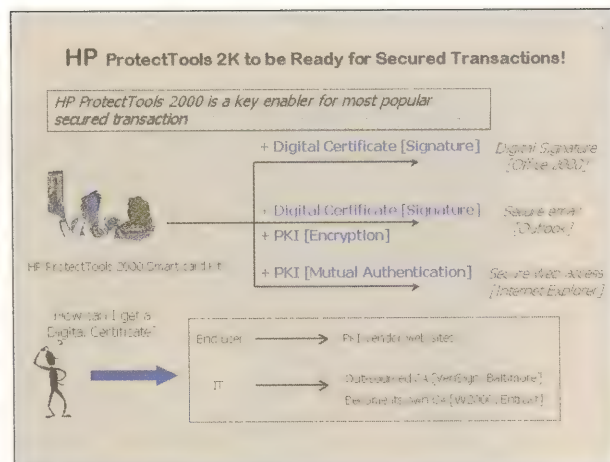


Figure 3: HP ProtectTools 2000 in a Secured Environment

— Robert Williams is Managing Partner for Enterprise Certified Corporation and the co-author of *The Ultimate Windows 2000 System Administration Guide* (Addison Wesley 2000), *Windows NT & UNIX: Administration, Co-Existence, Integration and Migration* (Addison Wesley 1998).

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Winning with Win2K



Microsoft Windows 2000 is finally upon us. The much-anticipated and simultaneously much-dreaded operating system is here, and information technology professionals now have to deal with it. Anticipated, because of new features that promise to make the implementation and maintenance of networks much simpler. Dreaded, because of the complexity, system requirements and uncertainty that Microsoft's newest operating system creates.

Ryan Maley

Here is a primer on Windows 2000, its new features, and some reasons to adopt, or wait and see.

THE HISTORY AND VERSIONS

Of course, Win2K is the successor to Windows NT, Microsoft's incredibly successful high-end OS that offered some enterprise-level functionality for a fraction of traditional enterprise OS costs. NT was an ambitious project that heralded Microsoft's move beyond its traditional consumer orientation and fit a basic need as IT organizations began to push services closer to users and farther from traditional data centers.

While the first versions of NT were primarily used as basic file and print servers, it has become a well-rounded OS. Built-in

features eventually grew to include remote access services, Web hosting and IP routing. But, of course, NT had a long way to go to catch up with the pack. As Microsoft wanted to become more of a player in the enterprise, its flagship OS had to grow and mature as well and Microsoft crafted plans for a bigger and better "bet the company" operating system.

Eventually, this turned into the various versions of Win2K. Win2K Professional is a replacement for NT Workstation. It's designed for a computer with at least a Pentium 133 MHz processor, 64 MB of RAM and at least 2 GB of hard disk space. There are now three different versions of the NT Server. Win2K Server requires a minimum of a Pentium 133 MHz proces-

sor, 256 MB of RAM and 2 GB of hard disk space. Win2K Server supports machines with up to four processors. Win2K Advanced Server has the same minimum requirements, but supports machines with up to eight processors. Win2K Data Center supports up to 32 processors.

Along the way, Win2K acquired a host of new and powerful features. Here's a look at some of the more important ones.

ACTIVE DIRECTORY SERVICE

Active Directory Service (ADS) is the biggest new feature of Win2K, and addresses one of the severe shortcomings of NT in large enterprises. It's an effort to integrate any and all directory services into a single, unified system and reduce the time required to create and maintain the various directories on your network. At the same time, it's designed to scale to much larger directory sizes than previously possible under NT.

The improved scalability is possible because of a hierarchical tree structure modeled on the Internet Domain Name Service (DNS). This structure distributes the directory service between multiple servers, each responsible for a particular portion of the namespace. This means that the DNS server responsible for hppro.com doesn't have to store every name and address on the Internet. It only needs to

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know the address of the computers in the hppro.com domain and the location of the DNS servers that can answer questions about everything else. Organizations that wish to provide DNS information to the Internet are required to have two DNS servers providing redundancy in the case of a DNS server failure.

The DNS model is markedly different than the domain model currently used by NT. The NT domains are directories primarily used to manage user security. Each domain features a Primary Domain Controller (PDC) that saves security information in the Security Accounts Manager (SAM), a database stored as an encrypted flat file. The SAM contains all the information about the domain: This includes the basic user information, such as account names, passwords and group memberships, and a list of the computers that are members of the domain. Having all this information in a single location helps ease management. However, it also means a single point of failure and a potential performance bottleneck.

Backup Domain Controllers (BDCs) alleviate some of these problems by storing backup copies of the SAM. A computer logging onto the network can be validated by any BDC, easing some of the validation burden. However, the BDC can't perform all PDC functions and doesn't completely eliminate the risk from a single point of failure. For instance, if the PDC is down, you may not be able to change a user's group memberships. And BDCs do not automatically become PDCs. If the PDC is down, you must manually promote the BDC to take over. (This is actually a good idea. Envision a WAN with a PDC in

users and 250 groups. This limitation may require multiple domains for a single large organization, which may require establishing trust relationships. Using a trust relationship, a trusting domain allows trusted domains access to its resources. Trust relationships can become very complicated very quickly, requiring a lot of maintenance. For instance, if you have four domains completely trusting each other, you need to establish 12 trust relationships.

With Active Directory, the concepts of primary and backup domain controllers and trust relationships go away. Under Active Directory, there are only domain controllers. To make an NT Server computer a domain controller, you need only install and start the Directory Service. Each and every domain controller can be used to update all the directory data, eliminating the problems of downed PDCs. Domain controllers discover other domain controllers on the network, and a technique called multimaster replication is used to propagate changes to the other controllers on the network. Each change in a directory on the domain controller is given an Update Sequence Number, which is something like a time stamp. If a controller is replicating conflicting data from multiple controllers, it can use the Update Sequence Number to decide which is the latest data. Domain controllers have authority over a particular namespace, just like in DNS. Active Directory domain names become like Internet domain names to simplify naming. Currently, NT domain names are limited to

15 alphanumeric characters. Under Active Directory, domain names can be identical to Internet names. For example, foo.com is a valid Active Directory domain name. Currently, an organization might have

several domains, such as Sales, Finance and Manufacturing.

To share resources, trust relationships would have to be established between the domains. Under Active Directory, these domains become sales.foo.com, finance.foo.com, etc. The traditional trust relationships are not necessary because the domains are now within the Active Directory hierarchy.

Active Directory should offer a lot of

possibilities for organizations to simplify the management of their users' information. It's also probably the most complex new feature in Win2K, and if you are planning to implement it, take time to consider how it will work in your organization.

DOMAIN NAME SERVICES

Domain Name Services (DNS) have really changed in Win2K. They now incorporate the latest features, as specified in the Inter-

DDNS allows the table of hosts to be updated by nodes on the network, rather than through manual maintenance.

net Engineering Task Force Request for Comments (RFCs). Specifically, dynamic DNS (DDNS) and service resource records (SRRs) are now supported.

DDNS allows the table of hosts to be updated by nodes on the network, rather than through manual maintenance. This solves one of the more annoying problems associated with Dynamic Host Configuration Protocol (DHCP) on NT networks: name resolution. Before, system administrators were forced to create Windows Internet Name Service (WINS) servers so that hosts with dynamically assigned addresses could be reached via name. Implementing WINS meant more work for system administrators to solve what was really a problem specific to NT, not the Internet at large. With DDNS, Win2K can actually update the name server with the appropriate records when the IP address is assigned. Additionally, Win2K DHCP servers will register non-Win2K clients as they assign addresses, so the entire network is reachable via name. This is a simple idea to describe, but difficult to implement and Microsoft has done a good job of recognizing the shortcomings in NT in the area and resolving them (no pun intended).

SRRs allow you to name specific nodes in DNS as providing specific services. For instance, you can create an SRR that defines the Web server for a domain. Simply create an SRR that defines a host name _http._tcp.hppro.com pointing to www.hppro.com. This allows SRR-capable browsers (like Internet Explorer 5.0) to automatically go to www.hppro.com whenever they are pointed to hppro.com. Similar SRRs are available for other stan-

With Active Directory, the concepts of primary and backup domain controllers and trust relationships go away.

Chicago and BDCs in New York and Los Angeles. If the WAN goes down, both New York and Los Angeles would promote themselves. When the WAN comes back up, you have three PDCs and a large mess.) What's worse, if you wish to have a regular member server become a domain controller, you have to reinstall NT.

NT domains are also not particularly scalable. Per Microsoft's guidelines, domains are generally limited to 26,000

dard Internet services, such as the Lightweight Directory Access Protocol.

Additionally, Win2K automatically creates SRRs for Active Directory controllers and legacy domain controllers. One other important feature is that multiple SRRs can be defined for a single service. So, in the above example, a second SRR can be defined for _http._tcp.hppro.com pointing to www2.hppro.com, providing some rudimentary fault tolerance and load balancing.

NTFS 5.0

NTFS, the NT native file system, has some interesting new features in version 5.0, including Distributed Link Tracking, Indexing Service, Encrypted File Service and Distributed File System.

Distributed Link Tracking allows applications to access files that have been moved by tracking the link to the file. The new Indexing Service runs in the background, scanning files and indexing the contents for fast retrieval. This allows some very complex queries to find files and quick location of files. The indexes are accessible from other Win2K machines and Internet Information Server. The Encrypted File Service will automatically encrypt data on an NTFS volume. The encryption makes the volume only readable in the machine that encrypts it. (Of course, sending the file to a FAT volume, such as a floppy disk, defeats the encryption.) The Distributed File Service has been available as an add-in under NT 4.0. It allows the creation of a single directory tree, containing file shares from various volumes or servers. This can simplify some share management for users.

All in all, there are quite a few enhance-

Offline storage permits tape drives to be used in addition to online disk drives for storing data.

ments to NTFS. None of the features may be a "must have" upgrade on their own, but taken together they can provide a reason to upgrade in more complex environments.

TERMINAL SERVICES

Win2K incorporates the features of NT 4.0 Terminal Server Edition. Terminal Services allow a user to connect to the Win2K server and run applications on the server as if you were at the console. This is done with

a special program called tsclient that can run on any Windows platform.

Terminal Services have been touted as a way to add mainframe-like functionality to Win2K. Basically, the idea is to permit thin computer/network appliance machines to run server-based applications without the hassles of deploying the software at each client. While this is a relatively good intention, it means that servers will have to have more processing power and memory to support the remote users.

Additionally, Terminal Services licensing is not a trivial matter. There are four types of licenses. Client Access Licenses are assigned to individual users and required to access a server. Internet Connector Licenses are limited-use licenses for Web-enabled applications. Built-in licenses are single client access licenses included with Win2K Professional. Temporary licenses are issued dynamically by a server when no other licenses are available. Aside from this general confusion (Microsoft itself seems very confused about how the Internet licenses work), there are costs associated with the additional licenses.

While there is undoubtedly some use for Terminal Services, there has not been a wholesale adoption of this model by IT departments. The strenuous hardware requirements necessary to give users decent performance still seems to be a problem. It seems more likely that Terminal Services will be used for remote management of servers. Since a license is included with Win2K Pro, it seems ideally suited for a network management station.

DISK QUOTAS

As the amount of network storage continues to grow at a very fast pace, most system administration managers keep wondering why and how to bring it under control. Most networks have at least a few users who insist on saving every byte that crosses their screen. Until Win2K, there was no way to automatically monitor and enforce limits on a user's disk storage. Disk quotas can be set for individual users on a disk-by-disk basis.

There have been third-party applications that can enforce and monitor quotas

on NTFS disks under NT 4.0. With Win2K, you won't have to spend extra money to get this functionality. The quotas are easy to implement. When permissions are set on a disk or directory structure, you can set the maximum storage limits per user. The quotas are disk-based, not directory-based. If a user has multiple folders on a disk (say, for an application in one share and for their net-

There have been third-party applications that can enforce and monitor quotas on NTFS disks under NT 4.0. With Win2K, you won't have to spend extra money to get this functionality.

work home directory in another), the total of all folders on the disk is used for enforcing quotas. This may require some individual adjustment to user quota levels, but is not a difficult task. An administrator can even set a warning level so a user receives a pop-up message when nearing their limit. By using the quotas, the system administrator may just save a few dollars on new disks and help users with the discipline of storage management.

OFFLINE STORAGE

Offline storage permits tape drives to be used in addition to online disk drives for storing data. While mainframe operating systems have offered offline storage for decades, the idea is new to Intel processor-based operating systems.

Offline storage is implemented through a complex rule setting process which permits lesser used files to be automatically removed from online devices (hard disks and RAID drives) to offline devices (tape drives and libraries). The process is done transparent to the user who simply accesses the file as they normally would. The difference is in access time: If a file has been moved to offline storage, it may take significantly longer to retrieve the file.

Some planning is required for a successful implementation. The rule set must be well-planned. For instance, files that have not been accessed in the last 90 days would probably be a good target for offline storage. Additionally, if you are not using a tape autoloader, provisions must be made for manually mounting the tapes at the server.

While offline storage is a nice new feature, the demand may not be too strong. It's not a substitute for standard backup procedures and may interfere if only a single drive is on the server. And, of course, users will have a hard time understanding why file access is taking so long. With the cost of disk drives continually plummeting and the steep cost of decent tape auto-loaders, offline storage won't be for everyone.

INTERNET CONNECTION SHARING & NETWORK ADDRESS TRANSLATION

While NT 4.0 has the ability to route IP packets, this is not always the best solution for connecting networks to the Internet. With Win2K Server, there are two new features to help connect a network to the Internet: Internet Connection Sharing (ICS) and Network Address Translation (NAT).

ICS is a function of the Dial-up Connections tool. It requires a network interface and some form of remote Internet connection, such as a modem, DSL adapter or cable modem. ICS is enabled on the external connection and the internal connection is automatically configured with a private Class C IP address (192.168.0.1). Other machines on the internal network get addresses from a DHCP service on the ICS server. Once ICS is configured, there aren't many options. The DNS name services, address range and subnet mask are preconfigured by the ICS service. As internal clients need to access the Internet, the ICS server translates the internal address to a

valid external address. Multiple users can be accessing the Internet using a single IP address. The ICS server appears as a single, although busy, node.

What ICS lacks in configurability, it makes up for in ease of use. It's very simple to activate and you can set up ICS with just a few clicks of the mouse. Even network administrators with no experience in Internet or routing can easily set up a shared connection.

If you need more functionality, you can use NAT. It's more complicated than ICS, but every aspect is configurable, making it very useful. Like ICS, NAT hides the network addresses of the internal

network from the Internet at large and allows internal clients to access the Internet at large. Unlike ICS, you can use many valid external addresses, any internal addresses and you can map specific ports. This is a very useful. For instance, you can put a Web server on your internal network, say at address 192.168.1.1. Normally, this private address would not be accessible to the Internet. With NAT, you can map port 80 with a valid IP address to 192.168.1.1 and everyone can access the internal Web server transparently. There are several reasons to want to do this. The first is security. If the internal network is numbered using private IP addresses, there is a limited risk of directly attacking the machines. Since the private addresses are not in the routing tables of any Internet routers, it is impossible to reach the network directly from a remote location. Another reason is flexibility. To move the Web site from one Web server to another, simply change the NAT mapping.

FINAL ANALYSIS

There are a lot of other new features. New laptop settings in Win2K Professional are plentiful. A built-in defragmentation feature is included. Support for roaming desktops has been improved. A new printer management system permitting control of print queues remotely via Web browser has been introduced. The list goes on.

So, should you upgrade? The new features are certainly compelling, but at some point, you just may not have a choice. Eventually, NT 4.0 will not be supported, and it will be imperative to get a supported OS. The industry will definitely move to Win2K because the industry always moves to the latest version, eventually.

There are an estimated 30 million lines of code in Win2K and that means a huge number of opportunities for bugs. While the code has gone through a huge and very public testing process, there is still much uncertainty. The best advice may be to go slow. Start with a plan. Where can you adopt Win2K in your environment and use that opportunity to learn? What planning do you need to successfully implement Active Directory? What resources do you need to support new Win2K users?

Don't make the mistake of upgrading, simply to upgrade. To successfully implement Win2K, you will need some foresight and planning. By examining the new features, you'll probably find some benefit to your organization. After that, you'll be ready. ♦

— Ryan Maley is a Microsoft Certified Systems Engineer and the Information Systems Manager for a Midwestern manufacturing company. He can be reached at ryan@maley.org.

With Win2K Server, there are two new features to connect a network to the Internet: Internet Connection Sharing and Network Address Translation.

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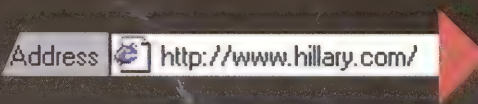
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Building Reusable Components from UNIX Applications



Andrew Lowe

The promise of object-oriented programming is to promote the reuse of code. Unfortunately, in most object-oriented programming languages, software reuse occurs at the source or binary object level. That is, application programmers need access to source level interfaces, such as header files and object libraries that they can link in to their programs.

Component programming is an extension of the concept of object-oriented programming that allows programmers to make use of reusable objects dynamically, using only binary representations of objects. Using components, a complex application can be composed from building blocks derived from many different sources, and these building blocks can be accessed directly using their binary representation.

WHY COMPONENTS?

Component technology allows you to integrate your existing applications with other applications in new ways, thus retaining the significant investment you have made in them. At the same time, componentizing your applications exposes their functionality to other programs. This article explores some of the perplexing architectural choices these technologies present us.

In "Application Porting," (*Platform Decisions*, August 1999), I introduced a

number of issues associated with planning and executing a platform migration from UNIX to Microsoft Windows (including NT and 2000).

One of the most fundamental issues we may face revolves around enabling mission-critical application software on the target platform. The most obvious and straightforward approach to this issue is to port these applications as-is, minimizing source code changes. For example, we may choose to use a portability layer of some sort to implement the system behaviors on which the applications depend. Examples of such portability layers for Windows NT include the POSIX conformant Interix subsystem developed by Softway Systems, and recently acquired by Microsoft (www.interix.com), Nutcracker from MKS/Datafocus (www.mks.com), or higher-level abstraction layers such as the Adaptive Communication Environment (www.riverace.com).

We refer to applications ported in this way as "literal" ports. Although many discrete changes may need to be made in order to make the application conform to the target environment, the architecture of the application, its inputs, outputs and processing remain essentially unchanged.

This is the most direct route to enabling the application on the new platform, and often is good enough for our purposes. In

some cases, however, we find that porting applications in this way can produce unsatisfactory results. In particular, we may want the application to interact with users and other applications in novel ways (for example, through an Internet or intranet).

Why should we want to do this? One reason is that candidate applications selected for porting often encapsulate some core functionality unique to the business environment in which they have been deployed. Such applications will be targeted for porting rather than replacement because they represent a significant investment of intellectual capital. They will often be based on more mature bodies of code, in many cases implemented in C, C++ or other programming languages, and their interfaces with other applications will often be obscure. Typically, these applications have been in existence for some time, and were not designed with features of the target platform in mind.

The way we accomplish this is to wrap up the application's functionality in a binary object (or "component"), that allows us to decouple that functionality from the user interface, databases, transaction monitors and other applications.

Two basic component models are of interest to us here: The Common Object Request Broker Architecture (CORBA), and Microsoft's Component Object Model (COM). CORBA is a widely accepted specification for binary object programming

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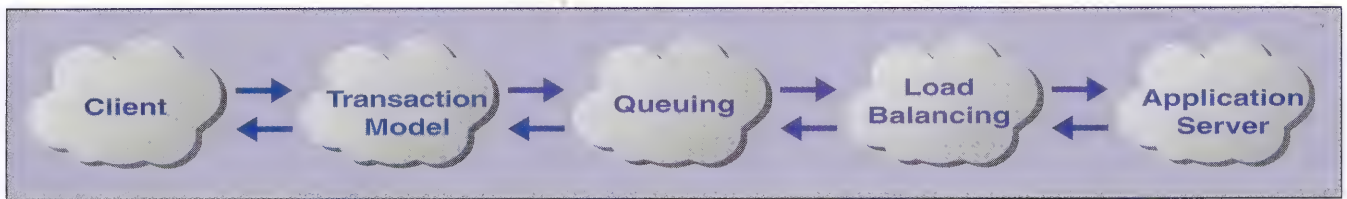


Figure 1: Generic Component Architecture

developed by the Object Management Group (OMG), a consortium of technology vendors and end user corporations. The OMG currently includes more than 800 member organizations. A widely used Internet protocol called Internet Inter-ORB Protocol (IIOP), built on CORBA is supported by a large number of technology vendors, like Netscape, Oracle, Sun, IBM, and others.

COM is Microsoft's mechanism for defining binary representations of objects. COM is fundamental to Microsoft Windows systems, and although its distributed version (DCOM) is conceptually similar to CORBA, the two architectures are not compatible at the binary level.

These competing architectures present us with some difficult design choices, which we will discuss in the next section. But, first let's examine how these systems are similar. A generic distributed component architecture as illustrated in Figure 1 shows how distributed object technology decouples client from the server in several ways.

The presentation logic on the client side may be composed of binary user interface components implementing forms, for example. These components communicate through several layers with application logic, also encapsulated in components on the server side. These intermediate or "middleware" layers may implement transactional semantics, asynchronous communications via message queues and load balancing.

The problem we face is exactly how to unleash the core intellectual capital from our existing applications, while integrating with other applications, binary components and middleware as seamlessly as possible. Our design may be constrained by dependencies on particular database systems, message queuing APIs or other fixed criteria of the existing environment.

TECHNOLOGY CHOICES

Here, you may choose from a number of competing technologies attempting to occupy the

same solution space. In particular, you may choose to deploy a solution conforming to Sun's Enterprise Java Architecture, or Microsoft's Windows DNA (Distributed Internet Architecture).

The architectural choices between these technologies can sometimes be perplexing. When is one more appropriate than the other? What are their advantages and disadvantages?

The key elements of Microsoft's Windows DNA architecture are Active Server Pages (ASP), and the Component Object Model (COM). Transactional semantics may be provided by Microsoft Transaction Server (MTS) and a buffering mechanism might be provided by some queuing software, such as Microsoft Message Queue (MSMQ). All of these services are tightly integrated with the Microsoft Windows architecture as shown in Figure 2.

The key feature of this architecture is its basis on the Windows platform for both client and server deployment. Interfaces to everything else, labeled "legacy" systems here, will be made through Microsoft's Integration Server (the next release of SNA Server, code named "Babylon"), or through a data interchange server based on the Extensible Markup Language (XML), called "BizTalk."

The key difficulty here is bridging the gap between the communication mechanisms available through COM and those presented by your existing application. Significant channels here include TCP/IP sockets and IBM SNA protocols. The

COMTI component of Integration Server provides the necessary bridging mechanism here. Using COMTI, and some glue logic necessary to massage your data formats into those required by the existing system, you can expose the functionality of that system to Web users.

These technologies are tightly coupled with other Microsoft technologies support-

The architectural choices between these technologies can sometimes be perplexing. When is one more appropriate than the other?

ing the enterprise. Thus, Active Server Pages find their best support in Microsoft's Web servers (IIS or Site Server Commerce Edition, or simply "Commerce Server").

Figure 3 (on page 27) illustrates an alternative approach to this same problem, based on the Enterprise Java Platform.

In this model, components are implemented as JavaBeans on the client side, or Enterprise JavaBeans on the server side. Applications are isolated from specific transaction monitors through the Java Transaction Service API (based on CORBA interfaces) and vendor independent IIOP. The Java Database API (JDBC) provides database connectivity. An application based on these interfaces can make use of binary objects presented by any CORBA-conformant object broker (ORB), and can connect to any database presenting a JDBC driver.

JDBC drivers exist for most widely used databases, such as Oracle, Sybase, IBM DB2 or Microsoft SQL Server. Similarly, the Java Messaging Service (JMS) provides the capability for asynchronous communications in a vendor-independent manner.

While commercial implementations are still lacking, JMS has been endorsed by a number of important vendors, notably IBM and BEA Systems.

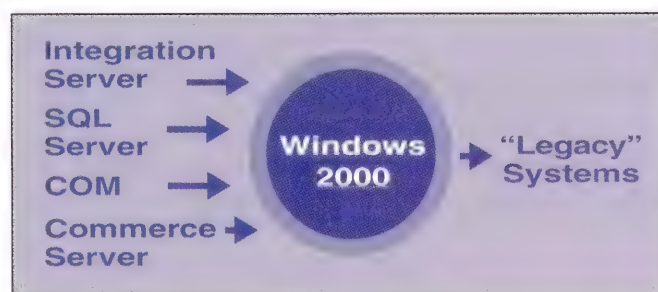


Figure 2: Windows DNA Architecture

What does this mean for us? We must choose between these two architectures, and there is very little common ground between them. If we choose to integrate with the Windows DNA architecture, we might try to wrap up our UNIX functionality in a COM object, or a COM object with transactional semantics (a so-called "COM+" object).

If we do this, we will tend to obtain better integration with Microsoft middle-ware, but at a cost of relatively greater platform dependence. Wrapping up our UNIX application in a COM component is not as difficult as it might otherwise be, due in part to strong development tools. For example, MKS/Datafocus allows you to use the ATL COM wizard to wrap UNIX code up into a COM object.

Conversely, if we choose a Java implementation, we may obtain greater vendor independence and better support in the UNIX world. We will still be able to deploy into a Windows environment, although not as easily as might be the case with a COM-based implementation. In this case, we will want to wrap up our legacy code into a shared library, and invoke it from Java wrapper objects using the Java Native Interface (JNI).

In either case, we may run into difficulties due to incomplete implementations or dependencies on specific middleware products. A number of major vendors have announced support for the Enterprise Java Architecture, but compatible commercial products are lagging somewhat. Similarly, some key components of Microsoft's Windows DNA Architecture are yet to be released, even in beta versions.

HOW DOES IT WORK?

Let's drill down and examine these basic approaches in a little more detail. In order to build a component, you must:

- Define an interface using an interface definition language
- Implement the interfaces
- Combine the interfaces with the implementations into an executable or shared library
- Register the component so consumers can find it

In order to use a component, we wrap it up in a container object. The container object acquires an instance from a server, which will provide the object's implementation. In COM, this is called the "class fac-

tory," in CORBA the "object resource broker" serves as the intermediary between containers and servers. The container then queries the object instance for the interfaces required, in order to invoke the object's methods.

The key concept here is that the container and the server may be implemented in any supported programming language, and may reside on different hosts, independent of operating system or hardware architecture.

Details of programming COM and CORBA are described elsewhere, but here it is important to note that although they are conceptually similar, the programming models are quite different.

Java provides a potential solution to this problem, since it provides portable interfaces to either CORBA or COM. Java and CORBA complement one another as a portable implementation mechanism and a platform-independent distribution mechanism respectively (visit <http://java.sun.com/~j2ee/corba>, and www.omg.org/library/wpjava.html).

At the same time, Microsoft's virtual machine allows Java and COM objects to interoperate. Thus, a Java program can access COM objects, and Java objects can present COM interfaces. The gotcha here is that the Java program must be compiled using the Microsoft Java compiler, using some Microsoft specific compiler directives.

WHAT CAN WE DO WITH IT?

Once we have an application wrapped up in a component, what can we do with it?

- Build a command line executable, daemon or installable system service.

- Build a GUI, using platform native components.
- Integrate with other components in novel ways (for example, you may be able to activate your component in a container document or spreadsheet).
- Build a control embeddable in a Web page.
- Integrate with a Web server to enable Web pages to deliver dynamic content.

The jury is still out on these baffling technology choices. While implementa-

Our recommendation is to carefully examine your environment requirements, ensuring that those requirements are met by supported versions of any third-party software on which your implementation will depend.

tions of some key Windows DNA components are still pending, broad industry acceptance of the Enterprise Java Architecture is increasing, particularly in the UNIX community. For example, a beta implementation of Java Server Pages and Java Servlets, integrated with the widely used Apache Web server is currently available in beta (visit <http://jakarta.apache.org>).

On the other hand, COM enjoys enormously wide acceptance as a fundamental component of thousands of widely used Microsoft Windows applications, deployed on millions of systems around the world. If you are targeting the Microsoft Windows platform for deployment, you will tend to achieve better performance, a lighter weight deployment and tighter integration with other Windows applications if you base your design around COM and the Windows DNA Architecture.

Our recommendation is to carefully examine your environmental requirements, ensuring that those requirements are met by supported versions of any third-party software on which your implementation will depend. ♦

— Andrew Lowe is the Chief Technologist for PSW Technologies Inc., and author of *Porting UNIX Applications to Windows NT* (Macmillan Technical Publishing).

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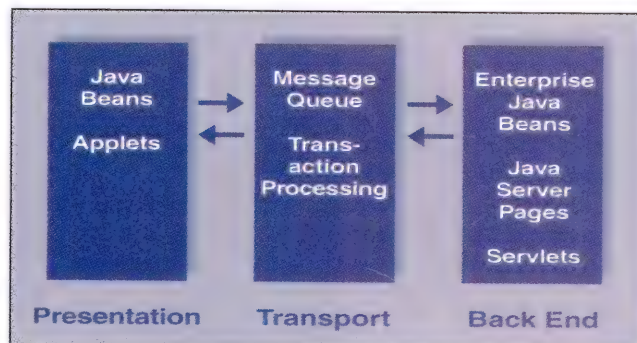


Figure 3: Enterprise Java Architecture

Servers with a Smile

Houlihan's Restaurant Adds Fibre to IT Menu

Karla Winter

In addition to operating more than 100 Houlihan's Restaurants, Houlihan's Restaurant Group features a series of other specialty restaurants that put the company among the top 10 casual dining businesses in the United States. To remain competitive, Houlihan's realizes that they need to manage their data extremely well. Carol Webster, Director of IT Technical Services, says, "Data is how you run your business and make your decisions. If you don't have the information, you make bad decisions or you don't make decisions at all, or you don't make them quickly enough." Houlihan's IT staff is charged with the critical task of ensuring the safety of the company's data. From daily food, liquor and labor costs to year on year analysis of sales, the company relies on their data to be successful.

THE TREND DU JOUR

It is the analysis of this accounting and operational data, the credit card reconciliation, gift certificate redemption, guest counts and daily sales of each menu item, that help the company remain competitive. "We've shifted the business from a once a month kind of collection and reporting activity to weekly and daily kinds of activities and analyses," says George Popson, CIO and Vice President of Information Technology. "This data allows us to react quickly and to recognize trends immediately, whether it is a trend that might be going the wrong way, and which needs further research, or a trend that is going the right way which we should capitalize on immediately," he says.

In addition to inputting data, kitchen managers access information from the corporate databases when they arrive in the



morning. This means that some servers need to be accessed 22 hours a day. With the time difference, and restaurants closing on the West Coast at 2 a.m. and kitchen staff arriving on the East Coast at 7 a.m., the backup window is a very narrow two hours. In addition, Houlihan's wants to keep one month of data online.

Houlihan's corporate headquarters has several servers, all various HP NetServer models. Currently, they have 235 GB of data, and this number is growing rapidly. Houlihan's had been using one DAT Autoloader to manage the backup process, but they soon realized that they were outgrowing the autoloaders and using them beyond their intended functionality.

At the time, they had three fewer servers and less data, however it was no longer an efficient use model for their needs. It took more than 12 hours to perform the backup, which meant that partial backups were occurring on open files and Houlihan's was not achieving reliable backups. Restores took too long, and the man-

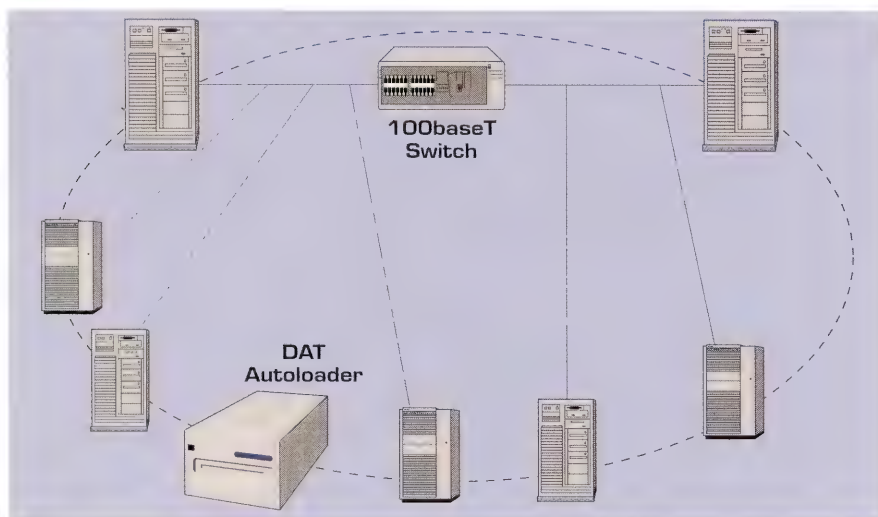


Figure 1: Current Configuration

agement of the whole process became overwhelming. "We'd come in and just cross our fingers and look to see if we had a backup. It was very unreliable," recalls Webster, "My staff and I were routinely coming in on weekends, and checking it, doing everything we could to ensure that we had a decent backup. I would estimate that we had one person spending at least two days a week on the backup, and that left only one person to handle the problems that arose in a normal day."

Houlihan's was using a 100VG network but with the constrictions from various protocol requirements, data was only able to move through the network at 18 Mbits/sec (see Figure 1). With this restriction in mind, and Houlihan's desire to use an automated backup solution, there were two alternatives that HP presented to Houlihan's. The first identified the necessary steps Houlihan's would need to take if they were to continue to work within the boundary of their existing network structure; the second proposed an alternative.

CURRENT CONFIGURATION: A LA CARTE SOLUTION

The first proposal was to install two dedicated backup servers onto the current network to streamline the backup process. HP proposed that Houlihan's install two HP NetServer LH3 servers and attach two 15-Slot, 2-DLT-7000 drive HP SureStore DLT Libraries to each server (see Figure 2). With the necessary network switch, this configuration would have enabled Houlihan's to pull 18GB per drive per hour and Houlihan's would have been able to backup 198 GB in two hours.

However, this alternative had limitations. First, there was no room for growth. Houlihan's, like most organizations, anticipates rapid growth in the future, and this scenario would need adjustment six months down the road. Second, this configuration would require considerable rerouting and re-switching

— something Houlihan's did not want to do unless it was absolutely necessary.

The second alternative was to install a Storage Area Network (SAN). The SAN creates a dedicated backup network that is separate from the main network (see Figure 3 on page 30). Demands on the main network are reduced, providing increased bandwidth availability for other functions. In addition, previous bandwidth constraints inhibiting the backup process are eliminated.

It was recommended that Houlihan's install a fibre channel arbitrated loop to handle the SAN traffic. Fibre channel provides greater speed and distance and a SAN topology provides far greater control and manageability of the backup and recovery network. "A SAN is basically local backup across the network," says Bruce Coxe, the HP Technical Specialist working with Houlihan's. "It allows Houlihan's servers to talk directly to the backup device across the fibre."

Carefully examine your environment requirements, ensuring that those requirements are met by supported versions of any third-party software on which your implementation will depend.

"WE'LL TAKE THE SAN, PLEASE"

Houlihan's chose the second alternative and installed one HP SureStore DLT Library with two DLT-7000 drives and 15 slots, with a Fibre Channel SCSI bridge, and Computer Associates ArcServeIT software. CA's ArcServeIT software provides fibre channel support into a SAN environment. In addition, the software has enhanced functionality, easy administration and advanced media management, all

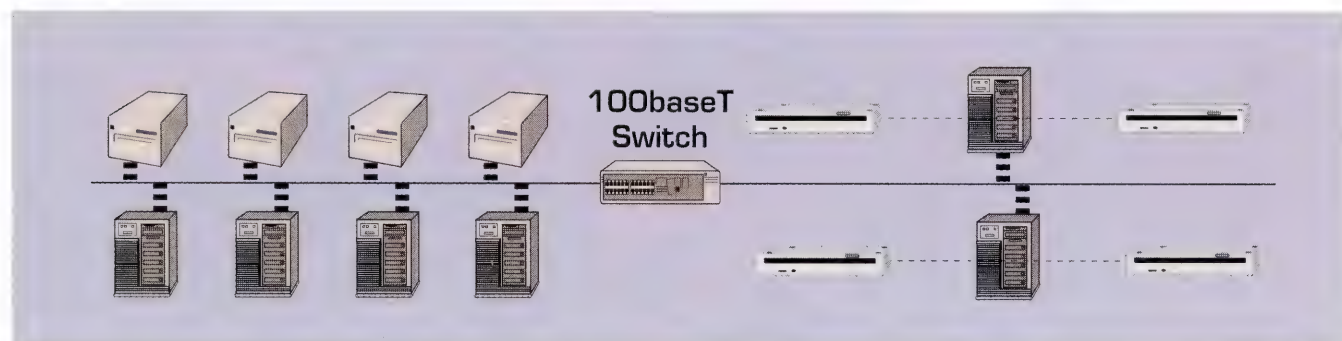


Figure 2: The first alternative installs a dedicated server onto the current mainframe.

features that Houlihan's had not received with their previous software solution. Implementing this solution saved Houlihan's more than \$90,000 – the cost of the two dedicated backup servers and the three additional DLT Libraries.

With the new SAN solution, Houlihan's receives reliable, consistent backups every night. Daily incremental backups are easily completed within the two-hour backup window. Full backups are completed in four hours, which is down from 12 hours with three less servers. Once the SAN solution is fully implemented, Houlihan's expects to further decrease their full backup completion time to one hour. The improvement has made life easier for the IT staff. "When they tell me that they did a restore for somebody, I don't have to worry that they got the right data or that the data was actually there," says Webster. In addition, the IT staff no longer needs to monitor the backup closely and now has time

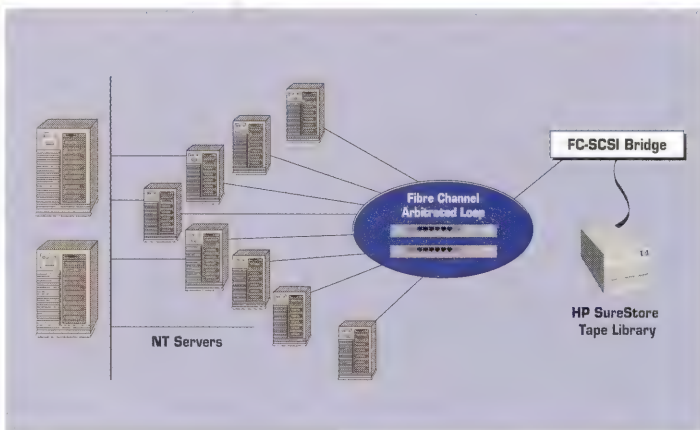


Figure 3: The second alternative installs a Storage Area Network.

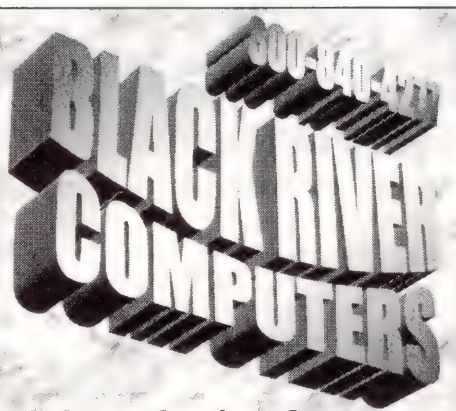
for better and faster customer service. And weekends are not spent in the IT room.

"To me, automated backup means you don't have worry about it. It is set to go, and it is going to go," says Webster, "We have other things to do, problems that come up, big projects – and the backup is not something that we can afford to work with every day. We can now set the job and have it recur consistently, with minimal intervention."

"Houlihan's has a very small IT staff, and it is important for us to have an automated solution," adds Popson. "It provides us with a method to stretch our limited resources. We no longer have people watching backups and making sure they are happening properly. Those people are now able to troubleshoot problems that come up in the organization. The reliability of the HP Library is also very important to us. We don't have people sitting in the

computer room 24x7, although our organization operates continuously. We need equipment that will reliably support us around the clock, and that is what we have with the HP DLT library." ♦

– Karla Winter is the Tape Library Product Manager for HP's Storage Systems Division. She can be reached at karla_winter@hp.com, or call (970) 635-6828.



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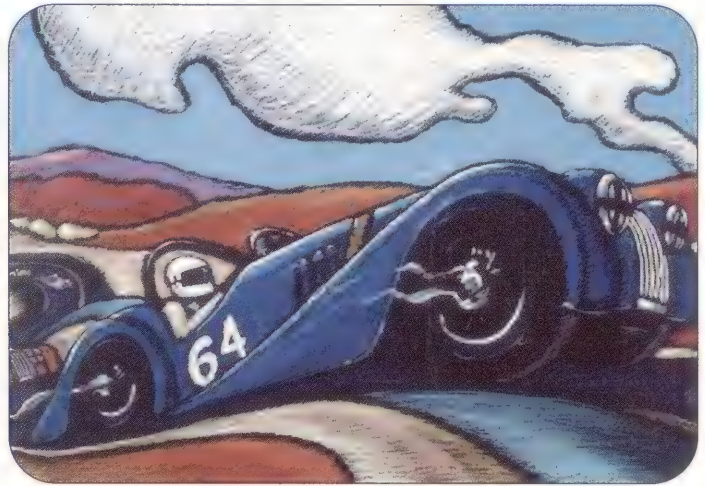
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HP Moves on IA-64

Jean Nattekemper, *Editor at Large*



Intel's Itanium, the first microprocessor to boast the Explicitly Parallel Instruction-set Computing (EPIC) architecture, may finally be poised for volume shipment. If all goes according to plan, this fall HP will launch an Itanium-based system that can run either HP-UX, Linux or Windows NT. MPE/iX systems with the EPIC architecture will ship about the time Intel unveils the second of its IA-64 chips, the McKinley.

Jim Carlson, HP's Director of Marketing for IA-64 systems, says, "We're bringing over a whole raft of applications under binary compatibility mode. Some have been recompiled and developed just for the system but many will run as strict binaries." Carlson adds that this parallels what HP did years ago with the HP 3000, in the transition from CISC to RISC technology.

HP and Intel expect much from the move to IA-64, not the least of which is a means of challenging Sun Microsystems, which owns a healthy share of the

64-bit high-end server market. Whether or not they'll be successful remains to be seen, but there's no doubt they have committed to a years-long struggle to bring IA-64-based systems to market. That struggle began with the formation of the HP, Intel alliance.

THE HP, INTEL ALLIANCE

Almost six years ago, HP looked into the future and saw that its PA-RISC chips would eventually run out of steam. The company knew it had to provide an architecture that would offer its customers performance headroom for the future. With that in mind, HP forged an alliance with Intel designed to develop a next-generation architecture. The companies intended to make the new architecture pervasive in the industry. HP had another goal in mind — the architecture would have to work on its HP 9000s and 3000s, extending their longevity for years to come (see Figure 1 on page 32).

Four years ago, Intel and HP completed their work on a specification for the new architecture. Intel started to design the first processor, then called Merced, and now called Itanium. HP simultaneously worked on the design of the system and developed an eight-way system using the Merced chip. The chip design fell behind schedule, however, so HP released its new eight-ways as the N Class servers.

Since the chassis, power supply and backplane bus of the N

class had been designed for IA-64, the system was machine board-upgradable to IA-64. For that reason, HP was able to demonstrate the first transaction on a Merced bus in October 1998.

As far as applications were concerned, HP was using simulators a great deal in the port of HP-UX to IA-64, and lab engineers were planning to demo the Oracle database application on the simulator. They also decided to demo Linux on the simulator. The interest in Linux spurred David Mosberger, an engineer in HP's labs to port the Linux kernel to IA-64. That was the beginning of the Trillian project, a consortium of vendors dedicated to making Linux work on Itanium chips.

The Trillian project has grown to embrace IBM, SGI, VA Linux Systems, Intel, Red Hat, Caldera, SuSE, TurboLinux, CERN and Red Hat-owned Cygnus. All four Linux vendors in the project have promised to ship versions of their software for IA-64 as soon as there are volume shipments of Itanium processors. Last February, Trillian made a version of Linux that runs on IA-64 available to the public.

As HP worked on HP-UX and Linux, it also teamed up with Microsoft to port NT to IA-64. And it didn't forget one of its longest-lived operating systems. In the summer of 1998, HP's Commercial Systems Division (CSY), announced that it has begun work on a port of MPE/iX to IA-64 and would develop IA-based HP 3000 systems.



HP IA-64's Jim Carlson

By this time, HP had also formed a consortium with two universities – the University of Illinois at Urbana-Champaign and New York University – to begin training computer scientists in the development of parallel structures. HP's purpose, Carlson says, is "to train scientists in how you actually develop a computer from scratch – develop your programs, compilers, software – to be able to feed information to a CPU in parallel to obtain high performance." If computer scientists are trained how to program for parallelism, Carlson says, "you get performance breakthroughs because someone says, for example, here's how we're going to do 16 instructions at a time."

In September 1998, the Trimaran consortium released the EPIC compiler technology into the academic community. HP's move gave all vendors the ability to develop fairly equal compilers. Carlson says, however, that over time HP plans to obtain an edge in compiler technology.

HP DEMOS ITANIUM-BASED SYSTEMS

Having helped to develop EPIC architecture and worked to further the acceptance of IA-64 processors, HP began to demonstrate applications running on Itanium-based systems. At Oracle OpenWorld last November, HP demonstrated binary and data compatibility using Oracle8i database software running on HP-UX 11 on an Itanium-based server. Using a dynamic translator it had developed, HP ran software originally compiled on PA-RISC on the IA-64 system. HP demonstrated data compatibility by using a database originally loaded from the PA-RISC version of Oracle 8i.

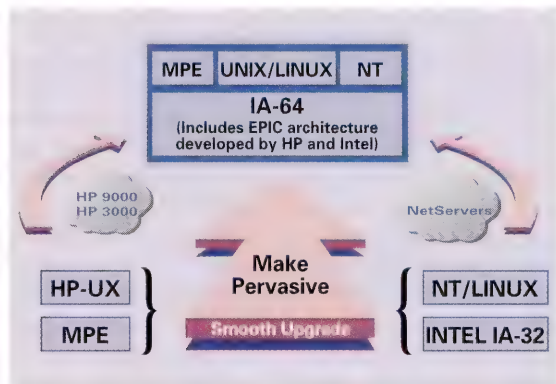


Figure 1: Operating Systems Moving to IA-64 – HP is working with four operating systems for IA-64: HP-UX, Linux, MPE/iX and Windows NT. IA-64-based systems for HP-UX, Linux and NT will be launched at the same time, and IA-64 systems for MPE/iX will follow later.

In February, HP followed up on its demo of the Oracle application by demonstrating other applications running on Itanium-based systems at Intel's Developer Forum. In an enterprise server demo, HP ran Synopsys' EDA application on Trillian Linux on an IA-64 server. The Synopsys software illustrates one market in which Itanium "makes a lot of sense," according to Jim Carlson. The application is used by electronics companies to verify complex system-on-chip and ASIC devices. Itanium's strong floating-point performance makes it particularly suitable for this market.

LOOKING AHEAD

HP is "slowly but surely getting software development machines from Intel," Carlson says. As the number of machines increases, HP is beginning to work with ISVs and developers within corporations – to make sure that binaries run properly. The process usually involves quick certification because of the binary compatibility with HP-UX.

HP also plans to establish porting centers in the United States and Europe – and may set one up in the Asia Pacific – to further development of solutions for IA-64. The centers will offer vendors an opportunity to port their software and create applications for a "three operating system combo," according to Carlson. In other words, vendors will be able to work with HP-UX, Linux and NT all at once, as well as test for compatibility on all three operating systems if they want to use binary compatibility as well.

As IA-64 moves forward, HP plans to continue to provide PA-RISC-based systems. This two-pronged strategy allows users to migrate to the new architecture when they're ready rather than being forced to make the transition. HP's retention of the PA-RISC architecture also

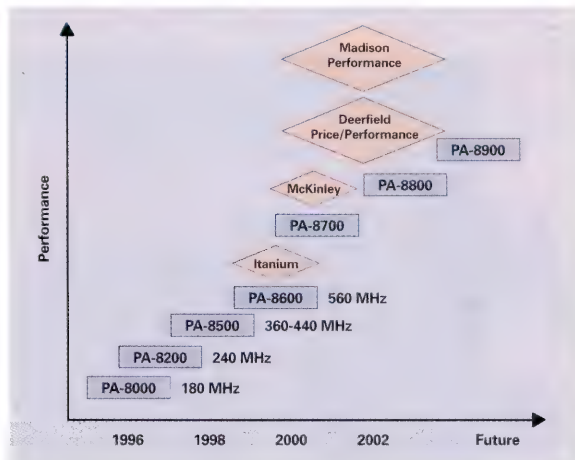


Figure 2: HP's Microprocessor Roadmap – HP will continue to develop PA-RISC-based systems as it introduces systems based on the IA-64 architecture.

HP-UX, Linux and NT systems on IA-64 are scheduled for launch this fall. MPE/iX systems are scheduled for launch about the time that Intel ships McKinley.

protects the HP 3000 installed base, made up of users of PA-RISC systems.

As HP launches IA-64-based systems, users may well find that their performance may not top the performance of high-end PA-RISC systems. This probably will not be true in the technical market, where the high floating-point performance of the Itanium pulls it ahead of most chips. But, it may well be true of OLTP performance.

"Here," Carlson says, "performance depends on a lot on tuning up and down the system. Bring out a new chip, even if it's a little bit faster, and the whole system has to be tuned to get the maximum performance."

HP has just demonstrated its PA-RISC strategy by launching the first system with the new PA-8600 processor. It also plans to launch a PA-8700-based system in about a year, and a PA-8800-based system about a year after that. Carlson says that the company hasn't decided yet whether or not it will launch the PA-8900 (see Figure 2). Carlson is clear about HP's long-term plans. "IA-64 is an extension of PA-RISC, and PA designers did a lot of the initial work on the architecture. Our goal always has been to move customers to IA-64." ♦

– Jean Nattkemper,
Editor at Large
jnattkemper@
hpro.com.



Time to Save Time in vi

It is very easy to get stuck in a rut, doing the same things the same ways, repeatedly. The purpose of this column is to help vi users get out of that rut. I received many e-mails about the vi columns we

ran over the last few months (see “We Got Mail” on page 34). Most were to request more vi information. This column is a direct result of those requests, so please, keep any type of subject matter requests coming.

There are advantages and disadvantages to doing things by rote (amazing how close that sounds to “rut”). The advantages are that they are automatic, without thinking, and thus fast. The disadvantage is that you might be doing things in an inefficient manner, and you could be faster by training your fingers to rely on different commands.

We are going to look at some of the more common tasks in vi, and mention what might be time-saving ways of doing things. If you are a good vi user, you will probably be aware of them. Then again, just because you are aware does not mean that you are not out of the rut. Take, for example, simple cursor movement in vi. Most users know that h and l move the cursor left (h) and right (l) by one character. Lesser experienced people might use the arrow keys instead. More experienced people know that the space bar also moves the cursor right, and backspace moves the cursor left. If you want to move the cursor in either direction several places, and you keep tapping these movement keys, you are in a rut. There is probably a faster way, after all, vi was written for performing rapid simple edits in a file. The faster way is to remember that all movement commands in vi can be preceded by a repetition number.

For example, typing 7h will move the cursor 7 places left. The point is that it is usually faster to guess a number of characters, then jump to that location at once,

rather than jumping up and down (so to speak) on the movement keys. A helpful part of commands like 22l or 10h is that they won't wrap across a line. If you guess way too many characters, they just leave the cursor at the end or beginning of a line, instead of wrapping up or down a line, so you can guess away with impunity.

An even faster way to move on a line can be used when you need to move to either the end or beginning. The command ^ will move the cursor to the first non-blank character on the line.

Hitting \$ moves to the last character on the line. It is often faster to use one of those two as a coarse movement, then do final adjustments with the single character movements. Another little known line movement command set is 0 (that is a zero, not an oh). This moves to the true beginning of line, even if it starts with blanks. You could also use the column command. That is, 1| means the same thing (that is a one followed by a pipe character). The | command can be used to move to specific columns on a line. For example, 25| moves to column 25.

Another way to move efficiently is with the word movement commands. Most people who are familiar with vi knew these word movements when learning vi, but get stuck in the rut of banging on single character movement commands instead. Trust me, it is worth the time to stop and think of the proper command. vi

was meant to be a fast editor, but it won't be without training your fingers to use the commands that make it fast.



Fred Mallett
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To move forward to the end of a word, use e or E. To move back to the beginning of a word, use b or B. To move forward to the beginning of a word, use w or W. All the capital versions of these word movement commands mean the same thing, including punctuation characters. This really makes a difference in efficiency when deleting or copying words, as well as when moving. For example, if the cursor were

on the first character in this string: SX-R, and you wanted to change that word for another, you might issue the command cw (or ce). After either command, the string would show as: S\$-X meaning that we are changing the “SX” part of the string, not the rest. If we had issued either cE or cW, we would be changing the entire string, so it would have changed to SX-\$. If you are not familiar with the change (c) command, you can type in as much or as little as you want until you hit the escape key. All text up to the \$ will disappear, either when you type over it, or when you hit escape.

If you are not doing it already, start remembering to precede movements by words with numbers. Again, just guessing that you want to move five words and hitting 5W, then using another word forward or back will probably be faster than banging on W. It does not take much practice to get so that you can guess accurately.

As far as speed when moving up and down in the file, remember to use numeric modifiers before the vertical movements, and you will be climbing out of that rut. For example, use 15j to move down 15 lines instead of hitting the j key 15 times. If you are moving more than a few lines, it is always faster to guess a number of lines, then zero in. You can also move vertically with the + and - commands. They move to the beginning of the target line, whereas the j and k commands try to maintain the column (if there are enough characters on the line). Control p and control j are the same as k and j, respectively.

Another shortcut that is often overlooked (or forgotten, or ignored) when moving around in a file is the move by sentence or paragraph commands. Parenthesis move the cursor forward to the end of a sentence or back to the beginning of a

Another shortcut that is often overlooked (or forgotten, or ignored) when moving around in a file is the move by sentence or paragraph commands.

sentence. The) obviously moves forward, the (moves back. Using braces moves by paragraph. A paragraph is defined as ending with an empty line, so } will move you to the next blank line in the file. Another little-known movement command is useful only in certain files. If the file has any braces as the true first character on a line, you can jump to those locations using [[or]], depending on if you want to move up or down in the file.

The final time saver for this column is the "repeat last edit" command. I hope all you vi users are already using this, because if you are not, you are really wasting some time. If you need to make a deletion, insertion or change repeatedly in a file, you only need to do it once. Take, for example, if I want to add some text in several places in a file. Move the cursor to the first location, and use the appropriate command (a A

i l o O) to insert (or append, or open a new line, whatever...) the text. Now just move the cursor to the next location (using some efficient method as mentioned above), and hit the period key (dot). Dot means redo the last edit, including whatever text you might have typed in.

So, get out of the rut. Start reaching out for forgotten, or unknown commands to make your editing faster. ♦

WE GOT MAIL



Vi-va la Fred!

HP Pro Columnist Fred Mallet has received many kudos for his January and February 2000 columns about using vi. Here are some of the responses:

Fred:

Just a quick note to let you know how useful I've found your recent series of articles on find and vi. It seems like each article is filled with juicy tidbits that you just can't find anywhere else. I hope this plea for "more" results in more! Thanks!

Alan Goldberg

Fred:

I enjoy your HP-UX Admin Man columns in HP Professional magazine. However, in the article in the February issue, I am confused by the commands that are printed as "vi/..." Where are such commands entered?

As far as more columns on vi, my request is YES, PLEASE.

**Richard Lathom, System Administrator
EDS/GM-Lordstown, Warren, Ohio**

Richard:

I can understand your confusion. I looked in the issue, and found that a glitch had appeared somewhere along the line between writing and printing. Might have been bitten by a translator program somewhere, but it appears that anywhere I had written this:

```
:g
```

it somehow got changed to:

```
vi
```

...Hmmmm ...At any rate, here is the original version of that section:

The global (:g) command accepts a pattern, and command as arguments. The format for the command is:

```
:g/pattern/[commands]
```

Note that the []s mean that the commands are optional. Global will perform the command supplied (or print as a default, if none is given) against all lines that contain a match for the supplied pattern. For example, both of these commands do the same thing:

```
:g/^#
```

```
:g/^#/p
```

This error was consistently wrong for the first two columns in the magazine. Sorry about that.

Fred Mallett

Fred:

This is in response to your last paragraph about saving vi for a future column, unless you get plenty of e-mail.

Well, I am attempting to help give you plenty of e-mail. I would like you to continue writing about vi right away, instead of saving them. I find these types of articles very informative, and they have helped me become a more powerful vi user.

Richard Henriques

HP OpenMail and Red Hat Linux, Part 2 – HP OpenMail

Last column, we talked about HP's port of its OpenMail messaging system to Linux. The column (available at the *HP Professional* Web site at www.hppro.com) discussed some background on OpenMail

and the installation of Red Hat Linux. This time, we'll discuss the installation of OpenMail.

The software distribution is on the first disk of the server bonus pack included with Red Hat Professional version 6.1. The HP directory on the disk contains software formatted to work with the installation program RPM, the Red Hat Package Manager. RPM is designed to allow users to better manage the software installations on their Linux machines. Using RPM, you can query an RPM install file to discover things, such as version numbers and library dependencies. You can also use RPM to verify the installation of a complete package.

For instance, you accidentally deleted a file that may (or may not) have been important to a particular software package. Using RPM you can check if the file was needed and replace it if necessary. In addition to operating from the command prompt, a graphical version, called GnomeRPM, is included for use from the Gnome desktop.

Using RPM, installation of OpenMail is simple, but requires a couple of steps. There is a "core" package to install, then a language specific package and you must be logged in as root. After inserting the CD, GnomeRPM starts automatically. Selecting Install usually brings up a list of all the packages available for installation. While I didn't find OpenMail in GnomeRPM, I navigated to the appropri-

ate directory on the CD and right clicked on the OpenMail core package. Selecting the Install option launched the installation routine. After installing the core, I installed the American English language pack, one of 12 language options. I also installed the graphical Linux client for OpenMail. After the packages have been "RPMed," you need to run a routine called omsinstall to decompress files and move them to the appropriate directories. The whole process takes less than 10 minutes on a Pentium II 266mhz machine.

After the installation is complete, a few post-installation tasks must be performed, such as adding the OpenMail directory to your path, setting the default language and defining a character set. If you use OpenMail as an IMAP server, you need to disable any IMAP server installed on Red Hat (this is defined in the `/etc/inetd.conf` file). When these are done, you

can start the OpenMail server with the command `omrc`.

Once it's up and running, administration can be handled in a variety of ways. First, there is a character-based program called `omadmind`. This can be used to configure mailnodes (OpenMail servers), add and delete users, and perform general maintenance. The interface appears a little dated and could use either a graphical overhaul or a Web-based interface. Other than that, it works as advertised, and it's very simple to maintain users. Additionally, many functions have command line equivalents. This is a distinct advantage over many other e-mail systems, such as Microsoft Exchange. Using the command line, you can create scripts to add large numbers of users in batches, or schedule maintenance tasks with `cron`.

A Motif client is provided and works just fine under Gnome. The first time you connect to the OpenMail server, you are prompted for a user and mailnode. After these are entered, you are prompted for a

See Server Side on Page 39



Ryan Maley
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The low cost of entry with a Linux system should earn it (OpenMail) a place in installations where price is an issue, such as small businesses or for departments.

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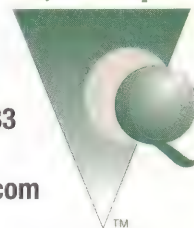
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Continued from page 35

password to actually connect to the server and begin using OpenMail. Everything you would expect from a mail client is here. An In-Tray, Out Tray and Waste-basket are standard. You can also create your own folders in the filing cabinet to sort your messages as you like. It's a simple interface for what really is a pretty simple task.

If you have Microsoft Windows-based clients, you can use MS Outlook to access your messages. There are a few additional steps required in the setup to support Outlook clients, but once done, it works just fine. If your Microsoft-based clients need to access more than one mail server, Outlook is a good choice, since it can access Exchange, POP and IMAP servers very well. OpenMail also supports Lotus cc:Mail clients, although I didn't test one.

If you don't like any of the above options, OpenMail also has a Web interface. Via the Web interface, any client with a browser can access their messages. The interface is great for remote users who need access and a boon for installations with security policies that do not

allow dial-in access or restrict access through a firewall.

I've worked extensively with Exchange and definitely believe the vast majority of tasks can be handled quite well with OpenMail. The low cost of entry with a Linux system should earn it a place in installations where price is an issue, such as small businesses or for departments.

While I wasn't able to really stress my OpenMail server, I am a little concerned about performance on lower end Linux systems. The release notes speak quite a bit about the number of processes used by OpenMail. Stating that it may use up to 50 processes and that each IMAP client uses at least three processes makes me wonder how much use a lower end Linux could take. While the stated requirements for memory (64 MB minimum, 128 MB recommended) certainly seem reasonable, the amount of processes being created seems excessive.

The release notes talk about increasing the maximum number of supported processes from the usual default of 512 by recompiling the kernel to support up to 4,090. This seems a little excessive,

and it's unlikely that someone without a serious Linux background will want to do this.

With that caveat, I did like OpenMail and if you are considering a move to Linux or looking for ways to get Linux into your organization, OpenMail is worth a look. It's a solid product with obvious benefits and will be a good fit for many organizations. ♦

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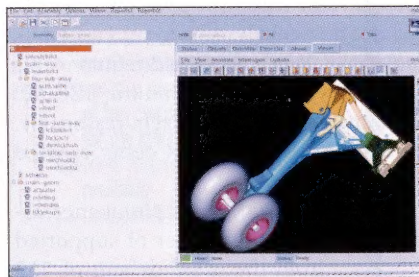
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Theorem Solutions' Data Exchange Navigator (DXN) is a data conversion tool for companies involved in concurrent engineering and collaborative design

and manufacturing. DXN is used in conjunction with CADverter products, and provides a hierarchical breakdown of the products structure definition for assembly modeling, EDM and PDM applications. Engineers can use DXN to access and integrate product information from different CAD systems and STEP formats, and can digitally inspect, evaluate and verify data before running a data conversion, all without using a CAD system. DXN supports HP Series 9000 HP-UX, IBM RS600 AIX, Silicon Graphics IRIX and Sun Solaris platforms. *For more information, call (513) 576-1100, or visit www.theorem-usa.com.*



PC-DOCTOR SERVICE CENTER 2000

Watergate Software's PC-Doctor Service Center 2000 is currently available at a \$50 discount at www.pcdoctorstore.com, Watergate Software's new Web store. Service Center 2000 is a software diagnostic testing solution for DOS, Windows 9x and Windows NT-based systems, components and peripherals. It is localized in ten languages and includes an enhanced set of tests for USB ports, audio ports, game ports and other industry standard hardware components. The Service Center 2000 e.Subscription Program ensures up-to-date diagnostic tests by delivering four updates a year. *For more information, call (510) 596-2080, or visit www.ws.com or www.pcdoctorstore.com.*

PANASITE ENTERPRISE

PanaSite Software's PanaSite Enterprise is their Web site content management software product. PanaSite Enterprise is an open-ended architecture, server-based application that works with Internet standard document types, such as HTML, ASP, XML and CFML. It captures content originating from nearly any computer and writes to any ODBC-compliant database. PanaSite's built-in Templatizer allows one to implement Enterprise during design and setup of a new Web site, or convert an existing site from its original configura-

tion into a PanaSite-powered Web site. *For more information, call (888) 9PANASITE, or visit www.panasite.com.*

MPI HOST-TO-PRINT SOLUTIONS

MPI Technologies has formed a joint marketing alliance with HP to provide host-to-print solutions across multiple applications and systems to output documents simultaneously on HP LaserJet printers. MPI Technologies has developed the Blue Kit and Blue Server as a part of HP's LaserJet Accessible Architecture Initiative. The Blue Kit is a DIMM-based solution that offers native AFP/IPDS capability to any LaserJet over Coax, Twinax or LAB attachments. The Blue Server is an NT/Novel print server that allows SCS and IPDS seamless printing on LAN-attached LaserJets from IBM Host systems. *For more information, call (714) 840-8077, or visit www.mpitech.com.*

N2H2 NETCOOL APPLICATION

N2H2 has deployed Micromuse's Netcool application and several Monitors in the Netcool/Internet Service Monitors suite. Micromuse's Netcool/ISM suite collects performance and availability data from 18 Internet protocols and services, which support the core set of services offered by all ISPs and leading corporations supporting e-commerce and Web initiatives. Netcool/ISMs' architecture is highly scalable, allowing service providers and corporations to improve the manageability of their Internet connections, corporate intranets and extranets. *For more information, call (800) 971-2622, or visit www.micromuse.com.*

REMOTE MANAGEMENT CARD AND CHIP

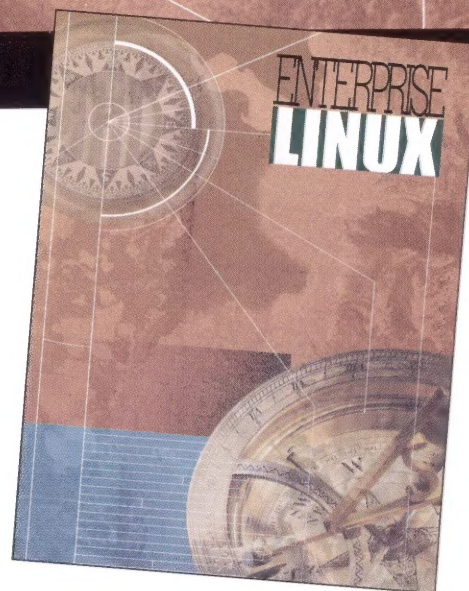
Agilent Technologies introduces its Agilent Remote Management Card (RMC) and embedded Remote Management Chip (eRMC). The RMC and eRMC provide server manufacturers with remote management solutions to comply with the Intelligent Platform Management Interface (IPMI) 1.0. Both the RMC and eRMC integrate into any PC or UNIX server. System administrators can use either the RMC or eRMC to gain secure access to servers for troubleshooting or remote administration. Should there be a problem, the RMC or eRMC will automatically send a notification message to the system administrator. *For more information, call (800) 477-6111, or visit www.agilent.com.* ♦

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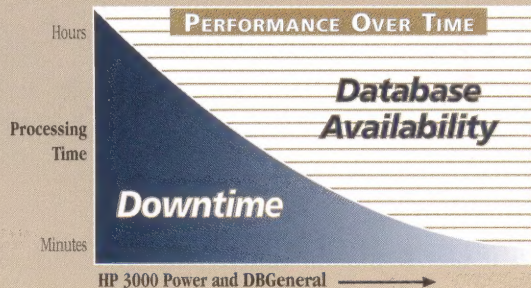
Hewlett Packard's strong commitment to provide "best-in-class" integration for the HP 3000 environment continues with the announcement of the new HP e3000 Server. For over 18 years, Bradmark's DBGeneral has followed the same level of commitment for database management utilities by offering comprehensive solutions to today's mission-critical problems.

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